would conflict with the fundamental precepts that define the role and operation of the American university system, they say. Strict interpretation, coupled with the severe criminal penalties that they contain, would be even more restrictive than direct classification of the research.

In response to the letter, whose addressees also include Mr Malcolm Baldrige, the Secretary of Commerce, the three federal agencies involved have apparently told the universities that they are looking closely at the problems raised, but it is expected to be several weeks before a formal reply is agreed upon.

The potential impact of the export control regulations on the academic community is already being discussed by an *ad hoc* committee set up last month by the National Academy of Science's Committee on Science and Public Policy.

The rules are also being closely studied by the National Science Foundation. Dr Donald Langenburg, the Deputy Director, says the foundation is "deeply concerned" about the potential impact of export controls on research, adding that it is "critical" to the freedom of scientific exchange that these are kept to a minimum consistent with foreign policy and national security objectives.

The growing tension between the academic community and the federal agencies over the interpretation of export restrictions is precisely the type of problem for a presidential science adviser, still absent from the White House. **David Dickson**

DNA research guidelines

Dutch get tough

Brussels

The publication by an *ad hoc* committee of revised safety rules for recombinant DNA research has raised some grumbles in Dutch industrial circles. By and large the new guidelines, the conclusions of a year's study of the risks of gene manipulation, follow closely those set by the National Institutes of Health in the United States. But while other European countries are moving towards a relaxation of the rules, the Dutch have tightened up the restrictions on research with pathogenic microorganisms.

Companies such as Unilever and Gest-Brocades, which are carrying out research into the industrial applications of bioengineering are, however, more frustrated about the administrative checks on research. In the Netherlands, DNA research is first vetted by the *ad hoc* committee, although there is no legal obligation to register the research. Local authorities then have the last word over individual experiments and any new research laboratories.

It is up to the committee, the local authority and university advisory groups to interpret the guidelines as they see fit. Industry complains that it is unnecessarily

restrictive to ask permission to carry out each individual experiment. Unilever has taken some of its projects to Belgium and Gest-Brocades has switched some of its resources to its UK laboratories. In the meantime both expect to wait at least a year for approval on new laboratories. The companies feel that local government authorities are much harder on industry than on universities.

The Netherlands is now thought to have the toughest rules in the world. Public distrust of DNA research caused four members of the *ad hoc* committee to abstain from the final vote on the new guidelines on the grounds that there should be a study of the impact of genetic engineering on society as a whole.

The European Community's Economic and Social Committee is taking the same option. Last July the European Commission brought out its own recommendation on the registration of DNA research, which stressed that over the past three years it had become clear that DNA research is not as dangerous as was originally thought. However, before agreement is reached between the Economic and Social Committee and the European Parliament, a public workshop is to be held in May that will bring together representatives from a cross-section of society to discuss the economic, social and ethical implications of such research.

The Commission's recommendation, if it is adopted, would do little more than establish common definitions and provide the basis for a consensus on registration procedures. However, many researchers increasingly feel that arguments about risk assessments are academic. The bulk of research is carried out in the lowest risk class and very rarely in PIII containment conditions. Thus, the slightly stricter rules proposed by the Dutch are expected to have little impact. **Jasper Becker**

Solar Polar mission

Joint project saved?

The European Space Agency (ESA) is "cautiously optimistic" that something will be salvaged from the International Solar Polar Mission, although in a less ambitious form than originally envisaged. The two-spacecraft mission to study the polar regions of the Sun was threatened last month when the US National Aeronautics and Space Administration (NASA) announced that, to meet budget cuts, it would not be building its spacecraft.

Although it is unlikely that NASA will restore the mission to its original status, angry protests and diplomatic pressure by European embassies in Washington seem to have prompted a compromise. According to ESA, that might involve NASA building a cheaper spacecraft — costing \$40 million rather than the \$100 million originally planned.

Under such a scheme, NASA's space-

Congress redispenses

Washington

A congressional subcommittee has now prepared the ground for restoring the United States half of the Solar Polar Mission. Last week, the space science subcommittee of the House of Representatives Science and Technology Committee voted to make cuts elsewhere in the National Aeronautics and Space Administration's (NASA's) budget for the fiscal year 1982; these cuts made it possible for the subcommittee to restore money for projects such as the Solar Polar Mission (which was given an additional \$15 million) without exceeding the total for the NASA budget of \$6,700 million proposed by Mr Reagan. Since the rearranged budget package will not incur additional costs, House Democrats are hopeful that the pro-space science subcommittee of the Senate Commerce Committee, which votes later this month on NASA's authorization, can also be persuaded to accept reinstatement of the solar spacecraft, perhaps on a smaller scale. **David Dickson**

craft, which would lose a de-spun platform carrying a solar coronagraph for direct imaging of the Sun, would be almost identical with ESA's. Two similar spacecraft would allow measurements of spatially and temporally resolved dynamic phenomena, which would not be possible with only one.

ESA's dismay at NASA's decision to abandon its part of the mission was largely due to the fact that it had already spent most of the money for its spacecraft in European industry. NASA, on the other hand, had delayed building its craft after the planned launch date of the mission was put back last year. If NASA is willing to compromise, ESA will agree to a further launch delay to 1986, even though it would increase the costs. The precise details of the compromise will have to wait until Dr James Beggs, NASA's new director, is installed. **Judy Redfearn**

Biotechnology

Canada takes stock

Washington

After six months of intensive study, a task force set up last summer to look at the development of biotechnology in Canada has recommended that the Canadian government should establish a ten-year National Biotechnology Development Plan, with a budget that would rise to about \$50 million a year. Most of this money would go on research and training; exploitation would remain for the private sector, which the task force recommends should receive significant tax incentives.

The task force was set up by Canada's Minister of State for Science and Technology, Mr John Roberts, and was

headed by Dr Maurice Brossard, director of research at the Institut Armand Frappier in Laval, Quebec (*Nature* 285, 431; 1980). Although acknowledging that the extra financial investments which it recommends would be a significant financial burden at a time of fiscal constraint, the task force says that the proposed sum "is a very conservative estimate of required federal expenditure".

Three factors are listed which make this expenditure important — the wide range of potential applications of biotechnology, the importance of biotechnology to Canada's future industrial development and "the almost complete lack of existing Canadian biotechnological capability".

On the last of these, the report is disarmingly frank. The second section of the report, "Biotechnology in Canada: An overview", contains two short paragraphs which refer to a "practically non-existent biotechnological industrial base", a rapidly shrinking federal government research capability and a highly fragmented and unfocused university research effort.

To correct this situation, the task force suggests that the graduate and postgraduate training programmes of the Natural Sciences and Engineering Research Council and the Medical Research Council should be increased by \$3 million and \$1.4 million respectively in the next financial year.

Less predictable is the proposal that Canada's immigration policies be revised "to address the immediate shortage of biotechnological skills which are in high demand worldwide".

The government is expected to endorse the proposal that commercial exploitation be achieved through tax incentives rather than direct government investment. The task force has, however, suggested direct government assistance of up to \$6 million to encourage small and medium-sized biotechnological industries. **David Dickson**

European uranium supply

Australia signs up

Brussels

A large slice of Europe's need for uranium over the next 30 years is to be met by a guaranteed supply from Australian ore. Australia and the European Atomic Energy Community (Euratom) last week initialled a draft of a joint nuclear safeguards agreement in Canberra which should enable Europe to buy uranium from Australia. Negotiations began in 1979 and the Canberra meeting was the fifth round. The agreement has been pursued with great determination by Euratom because Australia, with 20 per cent of the western world's uranium reserves, is very important to Europe's supply strategy.

The basic deal, to run for 30 years, is for Australia to guarantee supply of uranium exports in exchange for European

Community exports of nuclear technology and promises that the radioactive material will not be re-exported or used for military purposes.

Similar agreements are also being negotiated with Canada and the United States. The Canadian deal is a renewal of the 1959 agreement which expired last year and has run into difficulties on the issue of "sensitive" nuclear material (uranium enriched above 20 per cent). Negotiations to renew the agreement with the United States have been held up until the Reagan Administration is firmly in the saddle.

Negotiations with Australia went smoothly until the Australian government decided to impose new conditions. These included a commitment by Euratom member states to ensure an efficient monitoring of reprocessing techniques and to finalize an international plutonium storage programme; a promise not to use or store plutonium extracted from Australian uranium in a way that might lead to proliferation; and that the member states should ask for prior permission on a case by case basis to use the material for research or civil purposes.

In effect, then, the Australians are going further than the Nuclear Non-Proliferation Treaty. The Community negotiating team have been trying to establish precise definitions of the circumstances in which prior permission must be obtained. Does, for instance, using nuclear power to drive submarines constitute a peaceful purpose?

Full details of the new agreement, likely to be similar to the Australian deals with China and Japan, will not be divulged until the final text is agreed. **Jasper Becker**

Fraud in research

Congress asks why

Washington

Dr John C. Long, whose resignation from the Massachusetts General Hospital was forced last year after the discovery that he had fabricated research data, went before a congressional committee last week in sackcloth and ashes. The committee chairman, Representative Albert Gore, complimented him for shouldering full responsibility for his acknowledged "wrongdoing and dishonesty". Dr Long said that he liked his new job (as a surgical pathologist at a Detroit Hospital) — and that he had no plans to return to research.

Dr Long's remarkable statement was one of the few misdemeanours that the government oversight committee of the House of Representatives Committee on Science and Technology had been able to assemble for its two-day inquiry into wrongdoing in science. On the second day of the inquiry, officials from the Food and Drug Administration accused the National Cancer Institute of withholding information about the potential side effects of an anti-cancer drug it was testing. But most of the hearing was taken up with several cases of apparent fraud and abuse

that have recently emerged in the scientific literature and the public press.

The data which Dr Long admitted to fabricating were included in a paper published in the *Journal of the National Cancer Institute* (62, 787; 1979) in response to a critical comment by a referee. But Dr Long also admitted that he had concealed from his colleagues that cell lines purportedly derived from patients with Hodgkins's disease had been contaminated with other cells later shown to have been owl monkey cells (Harris *et al. Nature* 289, 228; 1981).

Nature misrepresented

Washington

In his evidence to the subcommittee, Dr Philip Felig said that two journals, one of them *Nature*, had refused to publish a letter of retraction. Dr Felig said that *Nature's* refusal to publish stemmed from a concern for the personal plight of Dr V. Soman, his collaborator responsible for an act of plagiarism who was afterwards found also to have falsified published data.

After the hearing last week, however, Dr Felig agreed with the editor of *Nature* that his evidence to the subcommittee had been misleading; that *Nature* had agreed to publish the retraction when the audit, then under way, of Dr Soman's laboratory work had been completed; and that at the time (June 1980), he had expressed himself as satisfied with this arrangement.

The chairman of the subcommittee was informed of this conclusion both by the editor and by Dr Felig, and agreed to include a note to this effect in the published record. Dr Felig's intended retraction was in respect of the paper "Regulation of the glucagon receptor by physiological glucagonaemia" by V. Soman and P. Felig, *Nature* 272, 829-832 (1978).

The force of his confession, however, was blunted by the statement by Dr Ronald Lamont-Havers, his former departmental head at the same hospital, that investigations carried out since Dr Long's departure have shown that other data, previously published, may also have been fabricated.

The subcommittee's objective last week was threefold: to estimate the frequency of wrongdoing in biomedical research, to understand the causes of such behaviour, and to decide if anything should be done.

Most witnesses agreed that falsification and plagiarism in the scientific literature is a rare but persistent phenomenon. Dr Donald Fredrickson, director of the National Institutes of Health (NIH), took some pleasure in telling the committee that Gregor Mendel's research results did not stand up to modern statistical analysis.

But even so, the Food and Drug Administration reported that it has disqualified 42